

SMSgt (Ret.) Rob Rosenberger

Twitter @rsnbrgr

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TROOP CARRIER AVIATION: ITS MISSION, ORGANIZATION & EQUIPMENT

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Prepared by:

KENNETH E. MARTS, Major, AC
Combat Operations Department
Troop Carrier Section

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TROOP CARRIER AVIATION: ITS MISSION, ORGANIZATION AND EQUIPMENT

1. INTRODUCTION. a. This conference concerns a branch of the Army Air Forces organized as a distinct type of aviation under the name of TROOP CARRIER. The purpose of this conference is to show how Troop Carrier Aviation evolved from our former military Transport service and developed into a Combat Arm of the Air Forces; and to show its mission responsibilities as a form of Combat Aviation; then to explain how it is organized and equipped to do this work.

b. Origin of Troop Carrier. Probably the most important fact to remember in regard to the origin of Troop Carrier Aviation is that the need for a specialized aviation of this type arose with the birth of the Airborne idea of warfare. Airborne employment of troops demanded air transportation. As it developed, just the fact of air transportation was not enough; it had to be an especially trained form of air transportation; and, further, it was even necessary that they be especially equipped and organized. So Troop Carrier, although an entirely new term, was nothing more than the logical readjustment of our former transport aviation to meet the combat needs of the Airborne forces.

c. History of growth. The statement that Troop Carrier is new leaves much to be desired in definitely fixing its origin in our Air Forces, for we have been aware of the military transport in some form or another for many years. A brief genesis of organizational expansion would show that "in the beginning" there was the 10th Transport Group. The 10th Group was the only unit of military transport aviation contained in our "Air Corps" as we called it, in 1939. As the Air Corps expanded and this group went from 4 to 8 squadrons it was seen that a larger organization must be established.

(1) The 50th Transport Wing was set up early in 1941. Cargo transport of military supplies and personnel was increasing rapidly; in addition, the pressing training programs with the new Airborne troops kept military transport busy. Then the business of ferrying aircraft for lend-lease came up. Demands upon Air Transport were surpassing the capacity of operations.

(2) In May of 1941 the Ferry Command was activated to handle the ferrying. The Service Commands began carrying a large part of their own freight with the establishment of their own air freight divisions and the allocation of certain units and equipment for the job. The 50th Transport Wing could begin to concentrate more intensely on the Airborne phase. When the war "broke" for the United States in December 1941, the 50th Wing was working steadily with Airborne forces in their early training.

(3) Finally, the 50th Wing enlarged to a full Command in the spring of 1942, known as the Air Transport Command - charged principally with the job of air transportation of Airborne forces for training and combat. Remember: working as separate entities were the Ferry Command and the Air Service Command to whom the work of ferrying and air freight was falling completely.

(4) Finally, by July 1942, because the work of Air Transport had become exclusively troop carrying, a name change was made in which it was redesignated Troop Carrier Command. At the same time the Ferry Command and the Air Freight divisions of the Air Service Command were consolidated and given

the name Air Transport Command, the same name discarded by the original organization now called Troop Carrier. What had happened, simply, was that the old organization had been given a new name "Troop Carrier" and a new organization, established to meet the emergency demands of war, had been given the old name.

(5) Today, although Troop Carrier and Air Transport Command function in separate spheres of operation, there is a certain interlock between them that generally appears vague. On the whole, however, the division is quite clear. Troop Carrier Aviation is controlled within the combat theaters as Theater Combat Transportation. Air Transport Command operates only to the theaters, BETWEEN the theaters, and back through the zones of communications to the United States. The domestic zones of the States, too, are the charge of the ATC. ATC is not set up to operate in the Combat Theaters. This part of the movement of freight and personnel becomes an additional mission of Troop Carrier Aviation. The only exception to this statement is the route operated by ATC from Dinjan, India, to Chungking, China, formerly referred to as the "hump", which is actually through the combat areas.

(6) As the fronts advance and the active combat areas move forward, Troop Carrier relinquishes what formerly were routes through combat zones to the ATC, who takes them over in turn as extensions of the zones of communications.

d. Missions of Troop Carrier. So we find that Troop Carriers are Theater of Operations forces, forming the air agencies for tactical, logistical, and evacuation combat transportation. (Chart #1) They are a part of the Army Air Forces especially organized, trained and equipped to function as theater combat transportation.

(1) Because of the multiplicity of their mission they must necessarily be organized, trained and equipped, depending upon the particular phase or phases from the over-all operations they are committed to perform. Thus, for this discussion, the several types of organizations we find under the heading of Troop Carrier Aviation are pointed out to show the part each plays in the execution of this general mission.

(2) Since the primary function of Troop Carrier Forces is tactical, their operation as a tactical team with Airborne Forces should be considered first. To understand both components of this term it would be well to examine briefly the Airborne force itself.

e. Coordination with Airborne Forces. Airborne Forces are Army Ground Force Units especially organized, trained, and equipped to utilize air transportation for entry into combat. (Chart #2) This does not mean that Troop Carrier will never be used to transport other units of the ground forces into combat. Any ground unit may be called upon to move by air if the situation warrants, but, primarily, Troop Carrier works with Airborne Forces. Tactically, Troop Carrier and Airborne Forces exist together and for the same purpose. They are a closely knit team whose object as a team is the tactical airborne thrust.

f. Types of Airborne operational units. Three categories of troops engage in Airborne operations and are conveniently distinguished among themselves according to the way they descend from the air. They are: Parachute Troops,

Glider Troops, and Air Landed Troops. Technically, the term "Airborne" has reference to only parachute and glider troops. The term "Air Landed" troops can apply to any and all other troops delivered and landed by plane alone.

g. Characteristics of Airborne Forces. A few brief facts about Airborne forces should be remembered.

(1) They are organized with the idea that their entire combat personnel can be landed for combat by parachute or in gliders.

(2) The organization takes a form similar to the normal Infantry division, except that it is about two-thirds the total strength, or about 8,500 men. It is a stream-lined division, composed of 2 Glider Infantry regiments, 1 3-battalion Parachute Infantry regiment, 2 Glider Artillery battalions and 1 Parachute Artillery battalion, plus anti-tank, engineer and medical units

(3) It is worthy of note here that the artillery carried by Airborne units is such as they are capable of transporting by air. Glider artillery is artillery capable of transportation by glider; and parachute artillery is artillery that can be broken down and dropped by parachute: normally, the 75mm Howitzer, the 37 mm anti-tank gun, 50/30 caliber machine guns, mortars and bazookas.

(4) These specialized fighting teams are troops of opportunity and are used when air transportation is the only way an objective can be reached. They must not be employed when the same mission can be as expeditiously or economically performed by other forces. They are trained for movement by air and are taught the use of the air medium in finely-timed procedures.

(5) Parachute and glider troops are not to be regarded as suicide forces and should be employed under such conditions in which their relief is planned within 3 days or when they can be withdrawn after their mission is completed.

2. ORGANIZATION. A. General. Although Troop Carrier's primary function tactically is with Airborne forces it does not necessarily follow that one single type of mission is considered all-important; for, in actual employment, one type of mission may be paramount in one theater, while in another theater a greater percentage of the operations may consist of other missions. Probably the simplest approach to an explanation of Troop Carrier Organization with its varied functions and assignments in the combat theater would be to begin with a discussion of its normal set-up as a Command. (Chart #3)

b. The Command. A Theater Troop Carrier Command is a headquarters established to coordinate and control the activities of the various Troop Carrier units received by the theater. A Command normally consists of two or more Wings, and a Wing normally consists of two or more Groups. The Group may be two or more, though normally four, Squadrons. The Squadron is a 360 man organization with 16 2-engine type transport aircraft and authorized all or any part of 32 15-place assault gliders and 16 40-place cargo type gliders. These glider types we will consider in more detail later in the conference.

(1) The normal assignment of a Troop Carrier Command is under the Theater Air Force. This headquarters acts as the normal channel of adminis-

tion and communication, as well as operational control for routine functions in the theater. Under this type of an assignment, Troop Carrier may be further assigned over to a Tactical Air Force which will assume full operational control of the Command for a given period of tactical operation to include the early training and rehearsal phases.

(2) When a Theater Air Task Force is organized, or if, as an Air Task Force, it is established on a more or less permanent basis, such as an Airborne Army, the Troop Carrier Command may be assigned to such an organization for operational control to remain as an integral part of such organization for the period of its existence. In the case of an Airborne Army, Troop Carrier is a definite part of the organization, even though administrative control may remain with the Theater Air Force.

(3) So we see that when a Troop Carrier Command is assigned and administered under a Theater Air Force, its operational control can be loaned temporarily to a Tactical Air Force for a certain operation only, or can be reassigned to an Air Task Force, such as the Airborne Army, for a period as long as the strategic usefulness of the force exists.

c. Special Forces. As the war has developed, the need for various types of special task forces has arisen out of varying tactical situations encountered in global warfare. This holds true for ground and air forces alike. Because Troop Carrier is involved as a means of transportation for both forces, the organization of special task forces has necessarily meant some specialized organization changes on the part of Troop Carrier.

(1) Troop Carrier with Air Commando. Special Task Forces have proven a successful means of controlling and coordinating the activities of units engaged in jungle warfare, when air support and air delivery of supplies plays a vital role. It is in a special task force of this kind that we may normally employ an Air Commando Group. The organization of the Air Commando Group calls for one Troop Carrier Squadron permanently assigned. In keeping with the "streamlined" structure of the Air Commando Unit, this Troop Carrier Squadron is a specialized unit, differing considerably from a normal squadron in that it is principally an Air Echelon unit, depending upon the Air Commando unit for normal ground echelon functions. This is done by using Airdrome Squadrons for the "housekeeping". The Troop Carrier Squadron in an Air Commando Group is separated completely from the normal command or control of Troop Carrier Aviation and is trained and functions with the Commando Unit throughout.

(2) Combat Cargo Groups. Combat Cargo Groups are another form of specialized Troop Carrier Aviation organized to meet the requirements for rapid air delivery of supplies, reinforcements and medical evacuation in Combat zones, isolated from normal supply channels.

(a) Here, again, we find an organization made up without a ground echelon. In the Combat Cargo Group all squadrons are air echelon units and normal functions of the ground echelon are performed by Airdrome Squadrons, likewise controlled by the Combat Cargo Group. Each squadron is equipped with 25 transport aircraft and no gliders. Although gliders may be used by Combat Cargo, should they be needed, none are assigned to the group unless the specific use for them arises. These units are organized in this manner for greater mobility and minimum load of administrative headquarters as against maximum control and

use of aircraft.

(b) Normally, Combat Cargo Groups will provide air transportation and aerial supply delivery to special task forces engaged in operations when normal supply delivery channels are inadequate or do not exist.

(c) Due to their special functions as differentiated from the operation of the normal Troop Carrier organization, Combat Cargo Groups may be assigned directly to the Tactical Air Force, which likewise controls all other aviation used in a given task force operation.

(d) The Combat Cargo Groups are the first Troop Carrier Units to be equipped with C-46 type aircraft.

(3) Pathfinder Units are the newest specialized organization of Troop Carrier. They had their birth in the preparation period prior to the Normandy invasion. These units are charged with the responsibility of locating exactly designated target points and placing personnel and/or equipment required to establish navigational aids for following serials; and to guide the lead ships of Troop Carrier formations into the correct target areas and the exact drop zones, assisted by established navigational aids.

(a) Pathfinder units are composed of highly trained Troop Carrier aircraft crews, trained extensively in the use of all navigational aid devices, such as the 717C Radar Screen, Rebecca-Eureka operation, the Radar Altimeter, Radar IDD sets, Loran (APN-4) or GEE (hyperbola Navigation), and the tactical use of all visual light signal devices.

(b) The Airborne jumping teams are composed of highly trained personnel from the Airborne forces charged with descending into the drop zones and landing zones from the Pathfinder ships by parachute, to set up Eureka beacon sets, lighted wind tees, and other navigational aids, as may be necessary for a given operation. The Airborne Pathfinder (jumping) teams and the Troop Carrier Pathfinder crews compose the special Pathfinder units.

(c) The Pathfinder units may be assigned to the headquarters controlling the Troop Carrier forces for a tactical operation, or may be assigned individually to each Troop Carrier Wing taking part.

3. MISSIONS. With the several forms of Troop Carrier organizations in mind, we can return to the consideration of missions.

a. Tactical. As previously stated, the primary tactical function of Troop Carrier is with Airborne Forces. Because Airborne operations are normally large-scale, mass operations generally conducted in connection with operations of other ground, air or naval forces, a considerable number of Troop Carrier units must be involved. The Troop Carrier Command set-up, previously described, is the standard organization for large-scale operations involving Airborne Forces in mass. A task force may be set up, an Airborne Army may be formed, or a Tactical Air Force may assume control, the forming of some type of single command under one head being the most desirable.

b. Logistical. The logistical functions of combat transportation are performed by all forms of Troop Carrier Aviation, regardless of their type of as-

signment or nature of their organization. If organized into a Command, and used primarily with Airborne forces, logistical operations will include the reinforcing and resupplying phases of any tactical operation; and all routine air movement of troops and supplies within the theater. In the case of Combat Cargo Units, their principal responsibility of maintaining combat reinforcements, supply, and resupply to combat areas is a Troop Carrier logistical function.

c. Evacuation. Regardless of organization and assignment, Troop Carrier in all theaters is the only medium of combat zone air evacuation. In general, evacuation missions are coordinated with the delivery of supplies and reinforcements, and can be performed either by aerial pick-up of gliders or by air landings. There are 3 types of air evacuation:

(1) Evacuation of casualties (when operations must be coordinated with medical evacuation units of personnel).

(2) Evacuation of units because of combat fatigue, or of entire forces when their mission has been accomplished and other means of transportation is not available.

(3) Evacuation of aircraft and equipment. These operations, largely for reclamation and salvage purposes, must be coordinated with service forces involved.

4. EQUIPMENT. a. Aircraft.

(1) The C-47. (Chart #4) The twin engine transport type aircraft in present use with Troop Carrier are the Douglas C-47's and C-53's. These two ships are essentially the same craft except that the C-47 has a large cargo door and heavily reinforced floor capable of accommodating heavy equipment, such as jeeps, cannon, and other bulky items; whereas, the C-53 has the regular size passenger door and is used for smaller freight and personnel only. For purposes of this discussion the C-47 will be used as representative of both types inasmuch as it is the predominant model.

(a) The Douglas transport has been an ideal troop ship throughout the development of Air Transport and Troop Carrier Aviation. When gliders were made into military craft, the glider program, being another form of Troop Transport, was superimposed upon Troop Carrier Aviation for functional reasons and the C-47 became a glider towship for every reason except design and performance qualifications. However, with a few changes (installations of tow mechanism and paddle bladed props to aid cooling in the high rpm operation required for tow) the C-47 emerged as a satisfactory although under-powered towship. From its initial trials in combat, it has towed the CG-4A Glider successfully. Judiciously used, and to a more limited extent, it can tow the CG-4A in pairs or in double tow. The towing of Cargo Gliders has met with only partial success with the C-47. For glider towing, the C-47 has been a limiting factor from a standpoint of performance, a factor balanced only by its excellent record as a paratroop and para-pack delivery craft.

(2) The C-46. (Chart #5) The C-46 (Curtis Commando) is now being received by Troop Carrier Units. Where the C-47 fell short in performance for glider tow the C-46 is meeting the requirements. With almost twice the horsepower, load capacity, and range, the C-46 is taking its place in Troop Carrier--

first to augment the use of C-47's and later to replace, at least in part, the use of the Douglas craft.

(a) The C-46 is being fitted with 2 paratroop jumping doors and special para-pack release racks designed to place twice the load of paratroops carried by a C-47 in the same area. It tows the CG-4A Glider very successfully and has proved to be an excellent towship for the CG-13A Cargo Glider.

(3) C-54. (Chart #6) At present writing little more than tentative plans have been laid for the assignment of C-54's to Troop Carrier Aviation. Definite uses for 4-engine craft are becoming apparent in analysis of future Pacific operations and certain special Troop Carrier Units may require the use of C-54 craft in connection with long range operations.

b. Gliders. Although gliders are now considered standard equipment in all Troop Carrier Units they are, nevertheless, a new means of combat air transportation. Prior to our present conception of the glider as a military craft we had long associated the term "Glider" with the ideas of soaring and un-powered flights making use of air currents and thermals. One military version is still a glider in the sense that it maintains the comparatively low wing loading and high glide ratio characteristics; however, the military payloads for which they are designed, and their consequently increased gross weights, have recreated the military glider more with the inherent characteristics of a power craft. So we have, actually, a powerless aircraft of conventional design with the inherent characteristics of a powered craft.

(1) Basically, the glider tow stems from a very fundamental law of physics: the fact that you can pull more than you can lift. Applying this principle to modern high horsepower aircraft, we find that the glider is a means of "parasiting" the excess horsepower. This, from a standpoint of performance, added to the tactical advantages of the glider, is making it a potent and versatile combat transportation medium.

(2) For tactical considerations there are two definite phases of glider operations, namely: The Assault phase and the Reinforcing phase. The assault phase includes the use of gliders in the first lifts or movement of airborne troops, carrying weapons, supplies and accompanying troops into the initial assault commitments of an Airborne operation. The reinforcing phase includes the use of gliders to deliver additional supplies and heavier weapons to the Airborne troops as their mission develops.

(3) Our CG-4A Assault Glider may be used in both phases. It is the only glider used with complete success in the assault phase and can be used successfully insofar as its load capacity permits in the reinforcing phase. Here, however, the need has arisen for the delivery of heavier weapons and equipment than can normally be delivered by the Assault Glider, hence the development of a heavier craft for this reinforcing phase only, to be used strictly as a cargo glider.

(4) The CG-4A Assault Glider. (Chart #7) The CG-4A was conceived early in our Airborne experience and built rapidly for immediate use. The demand for this craft, both tactically and training, has been so urgent that we have manufactured them with emphasis on mass production rather than continual structural and design improvements. As a result, today, we have been forced

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to forego a few design changes that would have improved the glider in order to have the quantity of craft available that we now need.

(5) The CG-13A Cargo Glider. (Chart #8) The CG-13A Glider has not proved entirely satisfactory for tow with the C-47, hence there has been very limited production of this model for the present. We have had excellent results, however, in using the C-46 for CG-13A tow, and future operations with the C-46 undoubtedly will bear out a greater tactical demand for the CG-13A than we manifest at present with the C-47. The CG-13A is the only American cargo glider in production at the present time.

c. Performance. (Chart #9) The first consideration in the use of Troop Carrier equipment that we will observe is the range of operation.

(1) Range of Operation. (a) For normal tactical operations, using full fuel capacity maximum tactical load, the C-47 is capable of transporting parachute troops and equipment to 600 miles, and returning to departure areas.

(b) In the tactical glider operation, C-47's are capable of towing C-4A's (in single tow) to a radius of 400 miles, releasing, and returning to departure areas, all within the limitations of a normal tactical operation.

(c) Utilizing the double tow of CG-4A Gliders, the C-47 is capable of operating as far as 300 miles from base in a tactical operation and returning.

(d) In combination with a cargo glider of approximately double the load carried in the CG-4A Assault Glider, the range operation of the C-47 remains approximately the same, as noted with the CG-4A in double tow. As an example of this type of tow, we take the cargo glider known as the CG-13A. The C-47 can tow it within a radius of action of approximately 300 miles.

(2) Load Performance. (Chart #10) Now, what type of performance in the manner of load carried is realized from the C-47 towing glider?

(a) In the single tow with the CG-4A Glider, we find that both transport and glider may be fully loaded, the plane with 804 gallons of gasoline and 5,500 pounds of cargo; and the glider to its maximum pay load of 3,750 pounds.

(b) In the double tow we find that both gliders may be loaded to their maximum pay loads of 3,750 pounds each and the plane, somewhat limited now, loaded only to 4,000 pounds. The performance results may be noted here in a marked loss of air speed (from 125 to 105) and definite restrictions on attainable altitude.

(c) Loads carried by the towing cargo gliders by C-47's will vary considerably, depending upon the type of cargo glider used. At present, the CG-13A, again used as an example, will carry approximately 7,000 pounds when towed by the C-47, provided the C-47 is not loaded. We note, here, a definite loss in load carrying efficiency as far as total weight moved is concerned. The off-setting advantage lies in the fact that the CG-13A will carry larger pieces of equipment than could be carried in either the CG-4A's in double tow. Likewise

it simplifies the problems of uniting combination loads carried in two CG-4A's through its ability to carry both in the same craft and to land them together.

(3) Tactical Aircraft as ~~Tow~~-ships. (a) It has been stated that the ultimate efficiency of glider employment has not been reached until both tow-ship and glider have a mission to perform. In the case of Troop Carrier as the tow medium, glider missions do not necessarily involve the use of the transport for any other reason than to tow the glider. Naturally, if it is at all within reason, the transport capacity is utilized. Parachutists, Aerial supplies, parachute packs, all may be carried. However, many missions arise when it is necessary to operate an empty transport while towing the glider. On the face of this it would appear that bombardment aircraft could easily tow Troop Carrier gliders to their objectives while they are enroute to bombing missions and in their own phase of operation. Although this is a mechanically sound theory, it lacks a substantial, practical and tactical basis at the present time. The mechanics of towing a ~~military glider~~ first of all require specific training on the part of tow ship crews. Successful tactical movement of gliders requires specific combined training of all craft involved. Discounting the fact that bombardment personnel lack the initial inclination for this type of work, they certainly lack the most important ingredient of all -- time.

(b) The Tactical Air Force is busy in its own mission at the time Airborne forces must be prepared or practising for a tactical move of this type. Inasmuch as rehearsal is mandatory for the successful execution of an Airborne move this combination of forces will preclude the use of tactical craft involved for their original mission, during a period of time preceding the planned Airborne mission. This period of time inevitably is the busiest time for Tactical craft in its softening up phase.

(c) Exponents of the idea of moving Airborne personnel and equipment by glider in tow with tactical aircraft have advanced these theories for operations in the Pacific, where distances will make it necessary to use craft of greater range than the present Troop Carrier ships. It is definitely planned that units not committed from the European Theater direct to the Asiatic Theater will be returned through the United States for reindoctrination. Such units could easily be trained here in the tactics of glider tow and their aircraft so equipped; then, should the situation arise, after their subsequent assignment in the Pacific area, in which it would be necessary for them to tow gliders in a given operation, they will at least have been trained in the mechanical procedures. It is the confirmed belief of Airborne and Troop Carrier personnel that with the present preponderance of aircraft and equipment available, no situation need arise in the Pacific in which Troop Carrier Aviation will be unable to fulfill its mission relative to the employment of Airborne troops in tactical operation due to any shortcoming of operational equipment. The fact that C-46's will be immediately available to Troop Carrier makes certain units at least capable of longer range operation.

5. SUMMARY. In brief, we have discussed the mission, organization, and equipment of Troop Carrier Aviation. To summarize at this point it would be well to repeat that Troop Carrier Aviation is to be regarded as a form of combat aviation functioning as a tactical, logistical, and evacuation agency in the combat zones. Its mission is one of combat transportation as applied to any Combat Theater Operation, warranting the use of Troop Carrier in any of its

varied forms. We have covered mission as it applies directly to specialized organization for the purpose of emphasizing the fact that Troop Carrier is especially organized, trained and equipped to meet the demands for combat transportation as they vary in every combat theater throughout the world.